Grade 5 Target A

Domain, Target, Standards, DOK, Vertical Alignments, Achievement Levels, Evidence Required, Vocabulary, Response Types, Materials, Attributes, Question Types, and Question Banks (Examples)

Content Domain: Operations and Algebraic Thinking
Target A [m]: 5.OA.A Write and interpret numerical expressions.
Standards included in Target A: 5.OA.A, 5.OA.A.1, 5.OA.A.2
Vertical Alignment
Achievement Level Descriptors
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Claim 1: Concepts and Procedures (DOK 1, 2) Question Banks
Claim 3 Communicating Reasoning Question Banks
Claim 4 Modeling and Data Analysis Question Banks

Content Domain: Operations and Algebraic Thinking

Target A [m]: 5.OA.A Write and interpret numerical expressions.

Standards included in Target A: 5.OA.A, 5.OA.A.1, 5.OA.A.2

5.OA.A Write and interpret numerical expressions.

5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

Vertical Alignment

Related Grade 4 standards

4.OA.A Use the four operations with whole numbers to solve problems.

4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

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Related Grade 4 Standards

6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.A.3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.

Achievement Level Descriptors

Level 1 Students should be able to evaluate numerical expressions that have either parentheses, brackets, or braces.

Level 2 Students should be able to write and evaluate numerical expressions having two non-nested sets of parentheses, brackets, or braces.

Level 3 Students should be able to write, evaluate, and interpret numerical expressions having any number of non-nested sets of parentheses, brackets, or braces.

Level 4 No Descriptor

Evidence Required

1. The student writes or identifies a numerical expression that records a calculation represented with words.

2. The student interprets numerical expressions in words without evaluating them.

3. The student evaluates numerical expressions with grouping symbols.

Vocabulary
sum, quotient, factor, dividend, divisor

Response Types
Multiple Choice, single correct response; Equation/Numeric

Materials
numerical and verbal expressions

Attributes
Verbal and numeric expressions may contain only non-nested grouping symbols. No negative numbers allowed.

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Claim 1: Concepts and Procedures (DOK 1, 2) Question Banks

Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Claim 1 5.OA.A.2 DOK Level 1

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

Evidence Required

The student writes or identifies a numerical expression that records a calculation represented with words.

Question Type 1: The student is presented with a verbal expression that represents a calculation with up to one set of grouping symbols.

1. Which expression correctly shows "12 times the sum of 5 and 7"?

A. 12 × 5 + 7
B. 5 + 7 × 12
C. 12 × (5 + 7)
D. 5 + (7 × 12)

Rubric: (1 point) The student selects the correct expression (e.g., C).

Response Type: Multiple Choice, single correct response

Question Type 2: The student is presented with a verbal expression that represents a calculation with two non-nested sets of grouping symbols.

1. Which expression correctly shows the difference between the product of 7 and 9 and the sum of 12 and 5?

A. 7 × (9 – 12) + 5
B. 7 × (9 + 12) + 5
C. (7 × 9) – (12 + 5)
D. (7 + 9) + (12 + 5)

Rubric: (1 point) The student selects the correct expression (e.g., C).

Response Type: Multiple Choice, single correct response

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Claim 1 5.OA.A.2 DOK Level 2

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

Evidence Required
The student interprets numerical expressions in words without evaluating them.

Question Type 1: The student is presented with a numerical expression

1. Which statement describes the value of the expression 4 × (18,932 + 921)?

    A. The value is 921 more than the product of 4 and 18,932.
    B. The value is 18,932 more than the product of 4 and 921.
    C. The value is 4 times as large as the sum of 18,932 and 921.
    D. The value is 4 times as large as the product of 18,932 and 921.

Rubric: (1 point) The student selects the correct interpretation of the expression (e.g., C).

Response Type: Multiple Choice, single correct response

Claim 1 5.OA.A.1 DOK Level 1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Evidence Required
The student evaluates numerical expressions with grouping symbols.

Question Type 1: The student is presented with a numerical expression that contains one set of grouping symbols.

1. Enter the value of 7 + (5 × 12).

2. Enter the value of 7 + (5 × 12) ─ 4.

Rubric: (1 point) The student enters the correct value (e.g., 67; 63).
Response Type: Equation/Numeric

Claim 1 5.OA.A.1 DOK Level 1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Evidence Required
The student evaluates numerical expressions with grouping symbols

Question Type 1: The student is presented with a numerical expression that contains two non-nested sets of grouping symbols.

1. Enter the value of (5 × 12) + (27 ÷ 9).

2. Enter the exact value of $(6 \times \frac{2}{3}) + (\frac{2}{8} + \frac{3}{8})$.

3. Enter the exact value of (2 ÷ 0.1) – (0.3 × 0.4).

Rubric: (1 point) The student enters the correct value (e.g., 63; $4\frac{5}{8}$ or equivalent; 19.88).

Response Type: Equation/Numeric

Claim 1 5.OA.A.1 DOK Level 1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Evidence Required
The student evaluates numerical expressions with grouping symbols.

Question Type 1: Taryn must place parentheses around numbers in this expression in order to make it equal 2.

30 ÷ 2 + 4 – 3

Which expression equals 2?

A. 30 ÷ (2 + 4 – 3)
B. 30 ÷ (2 + 4) – 3
C. 30 ÷ 2 + (4 – 3)
D. (30 ÷ 2) + 4 – 3

Rubric: (1 point) The student identifies the correct placement of parentheses (e.g., B).

Response Type: Multiple choice, single correct response

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Claim 3 Communicating Reasoning Question Banks

Claim Descriptors and Targets

Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

Example 1

Gil and Nina are comparing the numbers 3 and 12.
Gil says, “12 is 9 more than 3.”
Nina says, “12 is 4 times more than 3.”
What is true about Gil and Nina’s statements?

A. Nina is correct and Gil is not. You should multiply to compare the numbers.
B. Gil is correct and Nina is not. You should add to compare the numbers.
C. They are both correct. They just compared using different operations.
D. Neither one is correct. You have to compare like this: 12 > 3.

Rubric: (1 point) The student selects the correct statement (e.g., C).
Response Type: Multiple Choice, single correct response

Claim 4 Modeling and Data Analysis Question Banks

Claim Descriptors and Targets

Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

Example 1

Lilian wants to estimate the number of marbles in a glass jar that has a mass of 2.3 kilograms when it is full.
Part A:
Make an estimate for the mass of a single marble, in grams.
Enter your estimate in the response box. [ ]
Make an estimate for the mass of the jar, in grams.
Enter your estimate in the response box. [ ]
Estimate the number of marbles in the jar based on the assumptions you made.
Enter your estimate in the response box. [ ]
Part B:
The jar has a mass of about 500 grams and there are about 600 marbles in the jar. Which of the following estimates is closest to the actual mass of a single marble?
A. 2 grams
B. 20 grams
C. 200 grams
D. 1200 grams

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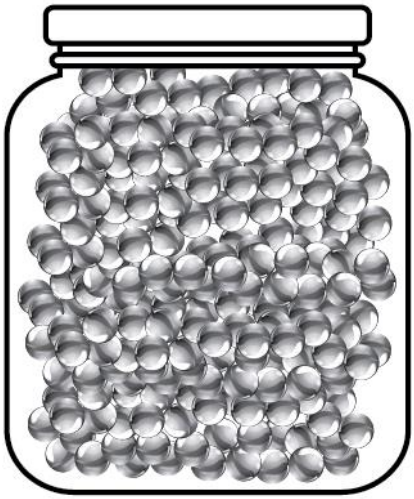

Rubric: (2 points) The student estimates the mass of a single marble m and the mass of the jar b, and makes an estimate of the number of marbles in the jar that is consistent with the initial estimates [e.g., (2300-b)/m +/-50, rounded to a whole number] and then selects the best estimate from the choices given (A).
(1 point) The student makes an estimate for the number of marbles that is consistent with his/her estimated masses in Part A or selects the best estimate from the choices given in Part B.

Response Type: Equation/Numeric and Multiple Choice, single correct response

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